

SEQUENCE LISTING

<110> Institute of Nutraceutical Research Pty Ltd
 <120> Connective tissue derived polypeptides
 <130> 119149/ROB
 <150> AU2003903037
 <151> 2003-06-17
 <160> 19
 <170> PatentIn version 3.1
 <210> 1
 <211> 187
 <212> PRT
 <213> Partial sequence of bovine NC4 domain of Type IX collagen alpha 1 chain
 <400> 1

Pro Arg Phe Pro Val Asn Ser Asn Ser Asn Gly Glu Asn Glu Leu Cys
 1 5 10 15

Pro Lys Val Arg Ile Gly Gln Asp Asp Leu Pro Gly Phe Asp Leu Ile
 20 25 30

Ser Gln Phe Gln Ile Asp Lys Ala Ala Ser Arg Arg Ala Ile Gln Arg
 35 40 45

Val Val Gly Ser Thr Ala Leu Gln Val Ala Tyr Lys Leu Gly Asn Asn
 50 55 60

Val Asp Phe Arg Ile Pro Thr Arg His Leu Tyr Pro Asn Gly Leu Pro
 65 70 75 80

Glu Glu Tyr Ser Phe Leu Thr Thr Phe Arg Met Thr Gly Ser Thr Leu
 85 90 95

Glu Lys His Trp Ser Ile Trp Gln Ile Gln Asp Ser Ser Gly Lys Glu
 100 105 110

Gln Val Gly Val Lys Ile Asn Gly Gln Thr Lys Ser Val Ser Phe Ser
 115 120 125

Tyr Lys Gly Leu Asp Gly Ser Leu Gln Thr Ala Ala Phe Ser Asn Leu
 130 135 140

Pro Ser Leu Phe Asp Ser Gln Trp His Lys Ile Met Ile Gly Val Glu
 145 150 155 160

Arg Ser Ser Ala Thr Leu Phe Val Asp Cys Asn Arg Ile Glu Ser Leu
 165 170 175

Pro Ile Lys Pro Arg Gly Gln Ile Asp Val Asp

180

185

<210> 2
 <211> 9
 <212> PRT
 <213> Type IX collagen alpha 1 chain peptide

<400> 2

Lys Ser Val Ser Phe Ser Tyr Lys Gly
 1 5

<210> 3
 <211> 9
 <212> PRT
 <213> Type IX collagen alpha 1 chain peptide

<400> 3

Lys Ile Met Ile Gly Val Glu Arg Ser
 1 5

<210> 4
 <211> 10
 <212> PRT
 <213> Type IX collagen alpha 1 chain peptide

<400> 4

Lys Leu Gly Asn Asn Val Asp Phe Arg Ile
 1 5 10

<210> 5
 <211> 11
 <212> PRT
 <213> Type IX collagen alpha 1 chain peptide

<400> 5

Arg Ile Glu Ser Leu Pro Ile Lys Pro Arg Gly
 1 5 10

<210> 6
 <211> 15
 <212> PRT
 <213> Type IX collagen alpha 1 chain peptide

<400> 6

Lys His Trp Ser Ile Trp Gln Ile Gln Asp Ser Ser Gly Lys Glu
 1 5 10 15

<210> 7
 <211> 21
 <212> PRT
 <213> Type IX collagen alpha 1 chain peptide

<400> 7

Arg Ile Gly Gln Asp Asp Leu Pro Gly Phe Asp Leu Ile Ser Gln Phe
 1 5 10 15

Gln Ile Asp Lys Ala
20

<210> 8
<211> 20
<212> PRT
<213> Type IX collagen alpha 1 chain peptide

<400> 8

Arg His Leu Tyr Pro Asn Gly Leu Pro Glu Glu Tyr Ser Phe Leu Thr
1 5 10 15

Thr Phe Arg Met
20

<210> 9
<211> 26
<212> PRT
<213> Type IX collagen alpha 1 chain peptide

<400> 9

Lys Gly Leu Asp Gly Ser Leu Gln Thr Ala Ala Phe Ser Asn Leu Pro
1 5 10 15

Ser Leu Phe Asp Ser Gln Trp His Lys Ile
20 25

<210> 10
<211> 9
<212> PRT
<213> Type IX collagen alpha 1 chain peptide

<400> 10

Lys Ile Met Ile Gly Val Glu Arg Ser
1 5

<210> 11
<211> 13
<212> PRT
<213> Type IX collagen alpha 1 chain peptide

<400> 11

Arg Ser Ser Ala Thr Leu Phe Val Asp Cys Asn Arg Ile
1 5 10

<210> 12
<211> 439
<212> PRT
<213> Cartilage oligomeric matrix protein [Fragment] - bovine

<400> 12

Asp Gly Val Leu Asn Glu Lys Asp Asn Cys Pro Leu Val Arg Asn Pro
1 5 10 15

Asp Gln Arg Asn Thr Asp Gly Asp Lys Trp Gly Asp Ala Cys Asp Asn
 20 25 30

Cys Arg Ser Gln Lys Asn Asp Asp Gln Lys Asp Thr Asp Lys Asp Gly
 35 40 45

Arg Gly Asp Ala Cys Asp Asp Asp Ile Asp Gly Asp Arg Ile Arg Asn
 50 55 60

Pro Val Asp Asn Cys Pro Lys Val Pro Asn Ser Asp Gln Lys Asp Thr
 65 70 75 80

Asp Gly Asp Gly Val Gly Asp Ala Cys Asp Asn Cys Pro Gln Lys Ser
 85 90 95

Asn Ala Asp Gln Arg Asp Val Asp His Asp Phe Val Gly Asp Ala Cys
 100 105 110

Asp Ser Asp Gln Asp Gln Asp Gly Asp Gly His Gln Asp Ser Lys Asp
 115 120 125

Asn Cys Pro Thr Val Pro Asn Ser Ala Gln Gln Asp Ser Asp His Asp
 130 135 140

Gly Gln Gly Asp Ala Cys Asp Asp Asp Asp Asp Asn Asp Gly Val Pro
 145 150 155 160

Asp Ser Arg Asp Asn Cys Arg Leu Val Pro Asn Pro Gly Gln Glu Asp
 165 170 175

Met Asp Arg Asp Gly Val Gly Asp Ala Cys Gln Gly Asp Phe Asp Ala
 180 185 190

Asp Lys Val Val Asp Lys Ile Asp Val Cys Pro Glu Asn Ala Glu Val
 195 200 205

Thr Leu Thr Asp Phe Arg Ala Phe Gln Thr Val Val Leu Asp Pro Glu
 210 215 220

Gly Asp Ala Gln Ile Asp Pro Asn Trp Val Val Leu Asn Gln Gly Met
 225 230 235 240

Glu Ile Val Gln Thr Met Asn Ser Asp Pro Gly Leu Cys Val Gly Tyr
 245 250 255

Thr Ala Phe Asn Gly Val Asp Phe Glu Gly Pro Phe His Val Asn Thr
 260 265 270

Ala Thr Asp Asp Asp Tyr Ala Gly Phe Ile Phe Gly Tyr His His Ser
 275 280 285

Ser Ser Phe Tyr Val Val Met Trp Lys Gln Met Glu Gln Thr Tyr Trp
 290 295 300

Gln Ala Asn Pro Phe Arg Ala Val Ala Glu Pro Gly Ile Gln Leu Lys
 305 310 315 320

Ala Val Lys Ser Ser Thr Gly Pro Gly Glu Gln Leu Arg Asn Ala Leu
 325 330 335

Trp His Thr Gly Asp Thr Ala Ser Gln Val Arg Leu Leu Trp Lys Asp
 340 345 350

Pro Arg Asn Val Gly Trp Lys Asp Lys Thr Ser Tyr Arg Trp Phe Leu
 355 360 365

Gln His Arg Pro Gln Val Gly Tyr Ile Arg Val Arg Phe Tyr Glu Gly
 370 375 380

Pro Glu Leu Val Ala Asp Ser Asn Val Ile Leu Asp Thr Thr Met Arg
 385 390 395 400

Gly Gly Arg Leu Gly Val Phe Cys Phe Ser Gln Glu Asn Ile Ile Trp
 405 410 415

Ala Asn Leu Arg Tyr Arg Cys Asn Asp Thr Ile Pro Glu Asp Tyr Glu
 420 425 430

Ala Gln Arg Leu Leu Gln Ala
 435

<210> 13
 <211> 159
 <212> PRT
 <213> Odorant-binding protein - bovine

<400> 13

Ala Gln Glu Glu Glu Ala Glu Gln Asn Leu Ser Glu Leu Ser Gly Pro
 1 5 10 15

Trp Arg Thr Val Tyr Ile Gly Ser Thr Asn Pro Glu Lys Ile Gln Glu
 20 25 30

Asn Gly Pro Phe Arg Thr Tyr Phe Arg Glu Leu Val Phe Asp Asp Glu
 35 40 45

Lys Gly Thr Val Asp Phe Tyr Phe Ser Val Lys Arg Asp Gly Lys Trp
 50 55 60

Lys Asn Val His Val Lys Ala Thr Lys Gln Asp Asp Gly Thr Tyr Val
 65 70 75 80

Ala Asp Tyr Glu Gly Gln Asn Val Phe Lys Ile Val Ser Leu Ser Arg

85

90

95

Thr His Leu Val Ala His Asn Ile Asn Val Asp Lys His Gly Gln Thr
 100 105 110

Thr Glu Leu Thr Glu Leu Phe Val Lys Leu Asn Val Glu Asp Glu Asp
 115 120 125

Leu Glu Lys Phe Trp Lys Leu Thr Glu Asp Lys Gly Ile Asp Lys Lys
 130 135 140

Asn Val Val Asn Phe Leu Glu Asn Glu Asp His Pro His Pro Glu
 145 150 155

<210> 14

<211> 245

<212> PRT

<213> human collagen type IX NC4 domain

<400> 14

Ala Val Lys Arg Arg Pro Arg Phe Pro Val Asn Ser Asn Ser Asn Gly
 1 5 10 15

Gly Asn Glu Leu Cys Pro Lys Ile Arg Ile Gly Gln Asp Asp Leu Pro
 20 25 30

Gly Phe Asp Leu Ile Ser Gln Phe Gln Val Asp Lys Ala Ala Ser Arg
 35 40 45

Arg Ala Ile Gln Arg Val Val Gly Ser Ala Thr Leu Gln Val Ala Tyr
 50 55 60

Lys Leu Gly Asn Asn Val Asp Phe Arg Ile Pro Thr Arg Asn Leu Tyr
 65 70 75 80

Pro Ser Gly Leu Pro Glu Glu Tyr Ser Phe Leu Thr Thr Phe Arg Met
 85 90 95

Thr Gly Ser Thr Leu Lys Lys Asn Trp Asn Ile Trp Gln Ile Gln Asp
 100 105 110

Ser Ser Gly Lys Glu Gln Val Gly Ile Lys Ile Asn Gly Gln Thr Gln
 115 120 125

Ser Val Val Phe Ser Tyr Lys Gly Leu Asp Gly Ser Leu Gln Thr Ala
 130 135 140

Ala Phe Ser Asn Leu Ser Ser Leu Phe Asp Ser Gln Trp His Lys Ile
 145 150 155 160

Met Ile Gly Val Glu Arg Ser Ser Ala Thr Leu Phe Val Asp Cys Asn
 165 170 175

Arg Ile Glu Ser Leu Pro Ile Lys Pro Arg Gly Pro Ile Asp Ile Asp
 180 185 190

Gly Phe Ala Val Leu Gly Lys Leu Ala Asp Asn Pro Gln Val Ser Val
 195 200 205

Pro Phe Glu Leu Gln Trp Met Leu Ile His Cys Asp Pro Leu Arg Pro
 210 215 220

Arg Arg Glu Thr Cys His Glu Leu Pro Ala Arg Ile Thr Pro Ser Gln
 225 230 235 240

Thr Thr Asp Glu Arg
 245

<210> 15

<211> 921

<212> PRT

<213> human alpha (IX) chain precursor

<400> 15

Met Lys Thr Cys Trp Lys Ile Pro Val Phe Phe Phe Val Cys Ser Phe
 1 5 10 15

Leu Glu Pro Trp Ala Ser Ala Ala Val Lys Arg Arg Pro Arg Phe Pro
 20 25 30

Val Asn Ser Asn Ser Asn Gly Gly Asn Glu Leu Cys Pro Lys Ile Arg
 35 40 45

Ile Gly Gln Asp Asp Leu Pro Gly Phe Asp Leu Ile Ser Gln Phe Gln
 50 55 60

Val Asp Lys Ala Ala Ser Arg Arg Ala Ile Gln Arg Val Val Gly Ser
 65 70 75 80

Ala Thr Leu Gln Val Ala Tyr Lys Leu Gly Asn Asn Val Asp Phe Arg
 85 90 95

Ile Pro Thr Arg Asn Leu Tyr Pro Ser Gly Leu Pro Glu Glu Tyr Ser
 100 105 110

Phe Leu Thr Thr Phe Arg Met Thr Gly Ser Thr Leu Lys Lys Asn Trp
 115 120 125

Asn Ile Trp Gln Ile Gln Asp Ser Ser Gly Lys Glu Gln Val Gly Ile
 130 135 140

Lys Ile Asn Gly Gln Thr Gln Ser Val Val Phe Ser Tyr Lys Gly Leu
 145 150 155 160

Asp Gly Ser Leu Gln Thr Ala Ala Phe Ser Asn Leu Ser Ser Leu Phe
 165 170 175
 Asp Ser Gln Trp His Lys Ile Met Ile Gly Val Glu Arg Ser Ser Ala
 180 185 190
 Thr Leu Phe Val Asp Cys Asn Arg Ile Glu Ser Leu Pro Ile Lys Pro
 195 200 205
 Arg Gly Pro Ile Asp Ile Asp Gly Phe Ala Val Leu Gly Lys Leu Ala
 210 215 220
 Asp Asn Pro Gln Val Ser Val Pro Phe Glu Leu Gln Trp Met Leu Ile
 225 230 235 240
 His Cys Asp Pro Leu Arg Pro Arg Arg Glu Thr Cys His Glu Leu Pro
 245 250 255
 Ala Arg Ile Thr Pro Ser Gln Thr Thr Asp Glu Arg Gly Pro Pro Gly
 260 265 270
 Glu Gln Gly Pro Pro Gly Pro Pro Gly Pro Pro Gly Val Pro Gly Ile
 275 280 285
 Asp Gly Ile Asp Gly Asp Arg Gly Pro Lys Gly Pro Pro Gly Pro Pro
 290 295 300
 Gly Pro Ala Gly Glu Pro Gly Lys Pro Gly Ala Pro Gly Lys Pro Gly
 305 310 315 320
 Thr Pro Gly Ala Asp Gly Leu Thr Gly Pro Asp Gly Ser Pro Gly Ser
 325 330 335
 Ile Gly Ser Lys Gly Gln Lys Gly Glu Pro Gly Val Pro Gly Ser Arg
 340 345 350
 Gly Phe Pro Gly Arg Gly Ile Pro Gly Pro Pro Gly Pro Pro Gly Thr
 355 360 365
 Ala Gly Leu Pro Gly Glu Leu Gly Arg Val Gly Pro Val Gly Asp Pro
 370 375 380
 Gly Arg Arg Gly Pro Pro Gly Pro Pro Gly Pro Pro Gly Pro Arg Gly
 385 390 395 400
 Thr Ile Gly Phe His Asp Gly Asp Pro Leu Cys Pro Asn Ala Cys Pro
 405 410 415
 Pro Gly Arg Ser Gly Tyr Pro Gly Leu Pro Gly Met Arg Gly His Lys
 420 425 430

Gly Ala Lys Gly Glu Ile Gly Glu Pro Gly Arg Gln Gly His Lys Gly
 435 440 445
 Glu Glu Gly Asp Gln Gly Glu Leu Gly Glu Val Gly Ala Gln Gly Pro
 450 455 460
 Pro Gly Ala Gln Gly Leu Arg Gly Ile Thr Gly Ile Val Gly Asp Lys
 465 470 475 480
 Gly Glu Lys Gly Ala Arg Gly Leu Asp Gly Glu Pro Gly Pro Gln Gly
 485 490 495
 Leu Pro Gly Ala Pro Gly Asp Gln Gly Gln Arg Gly Pro Pro Gly Glu
 500 505 510
 Ala Gly Pro Lys Gly Asp Arg Gly Ala Glu Gly Ala Arg Gly Ile Pro
 515 520 525
 Gly Leu Pro Gly Pro Lys Gly Asp Thr Gly Leu Pro Gly Val Asp Gly
 530 535 540
 Arg Asp Gly Ile Pro Gly Met Pro Gly Thr Lys Gly Glu Pro Gly Lys
 545 550 555 560
 Pro Gly Pro Pro Gly Asp Ala Gly Leu Gln Gly Leu Pro Gly Val Pro
 565 570 575
 Gly Ile Pro Gly Ala Lys Gly Val Ala Gly Glu Lys Gly Ser Thr Gly
 580 585 590
 Ala Pro Gly Lys Pro Gly Gln Met Gly Asn Ser Gly Lys Pro Gly Gln
 595 600 605
 Gln Gly Pro Pro Gly Glu Val Gly Pro Arg Gly Pro Gln Gly Leu Pro
 610 615 620
 Gly Ser Arg Gly Glu Leu Gly Pro Val Gly Ser Pro Gly Leu Pro Gly
 625 630 635 640
 Lys Leu Gly Ser Leu Gly Ser Pro Gly Leu Pro Gly Leu Pro Gly Pro
 645 650 655
 Pro Gly Leu Pro Gly Met Lys Gly Asp Arg Gly Val Val Gly Glu Pro
 660 665 670
 Gly Pro Lys Gly Glu Gln Gly Ala Ser Gly Glu Glu Gly Glu Ala Gly
 675 680 685
 Glu Arg Gly Glu Leu Gly Asp Ile Gly Leu Pro Gly Pro Lys Gly Ser
 690 695 700

Ala Gly Asn Pro Gly Glu Pro Gly Leu Arg Gly Pro Glu Gly Ser Arg
 705 710 715 720
 Gly Leu Pro Gly Val Glu Gly Pro Arg Gly Pro Pro Gly Pro Arg Gly
 725 730 735
 Val Gln Gly Glu Gln Gly Ala Thr Gly Leu Pro Gly Val Gln Gly Pro
 740 745 750
 Pro Gly Arg Ala Pro Thr Asp Gln His Ile Lys Gln Val Cys Met Arg
 755 760 765
 Val Ile Gln Glu His Phe Ala Glu Met Ala Ala Ser Leu Lys Arg Pro
 770 775 780
 Asp Ser Gly Ala Thr Gly Leu Pro Gly Arg Pro Gly Pro Pro Gly Pro
 785 790 795 800
 Pro Gly Pro Pro Gly Glu Asn Gly Phe Pro Gly Gln Met Gly Ile Arg
 805 810 815
 Gly Leu Pro Gly Ile Lys Gly Pro Pro Gly Ala Leu Gly Leu Arg Gly
 820 825 830
 Pro Lys Gly Asp Leu Gly Glu Lys Gly Glu Arg Gly Pro Pro Gly Arg
 835 840 845
 Gly Pro Asn Gly Leu Pro Gly Ala Ile Gly Leu Pro Gly Asp Pro Gly
 850 855 860
 Pro Ala Ser Tyr Gly Lys Asn Gly Arg Asp Gly Glu Arg Gly Pro Pro
 865 870 875 880
 Gly Leu Ala Gly Ile Pro Gly Val Pro Gly Pro Pro Gly Pro Pro Gly
 885 890 895
 Leu Pro Gly Phe Cys Glu Pro Ala Ser Cys Thr Met Gln Ala Gly Gln
 900 905 910
 Arg Ala Phe Asn Lys Gly Pro Asp Pro
 915 920
 <210> 16
 <211> 243
 <212> PRT
 <213> chicken collagen type IX NC4 domain
 <400> 16
 Thr Tyr Gln Gln Gln Ser Arg Leu Pro Val Ile Leu Gly Ala Arg Gln
 1 5 10 15

Arg Thr Asp Leu Cys Pro Thr Ile Arg Ile Gly Glu Asp Asp Leu Pro
 20 25 30
 Gly Phe Asp Leu Ile Ser Gln Phe Gln Ile Glu Lys Ala Ala Ser Gln
 35 40 45
 Gly Ile Val Gln Arg Val Val Gly Ser Thr Ala Leu Gln Val Ala Tyr
 50 55 60
 Lys Leu Gly Pro Asn Val Asp Phe Arg Ile Pro Thr Ser Ala Ile Tyr
 65 70 75 80
 Ser Asn Gly Leu Pro Asp Glu Tyr Ser Phe Leu Thr Thr Phe Arg Met
 85 90 95
 Thr Gly Ala Thr Leu Gln Lys Tyr Trp Thr Ile Trp Gln Ile Gln Asp
 100 105 110
 Ser Ser Gly Lys Glu Gln Val Gly Val Asn Leu Asn Gly Pro Met Lys
 115 120 125
 Ser Val Glu Phe Ser Tyr Lys Gly Val Asp Gly Ser Leu Gln Thr Ala
 130 135 140
 Ser Phe Leu His Leu Pro Phe Leu Phe Asp Ser Gln Trp His Lys Leu
 145 150 155 160
 Met Ile Ser Val Glu Thr Thr Ser Val Thr Leu Phe Ile Asp Cys Ile
 165 170 175
 Lys Val Glu Thr Leu Asn Ile Lys Pro Lys Gly Lys Ile Ser Val Asp
 180 185 190
 Gly Phe Ser Val Leu Gly Arg Leu Lys Asn Asn Pro Gln Ile Ser Val
 195 200 205
 Pro Phe Glu Val Gln Trp Met Pro Ile His Cys Asp Pro Leu Arg Pro
 210 215 220
 Gln Arg Glu Gly Cys Gly Glu Leu Pro Ala Arg Ile Ser Gln Thr Val
 225 230 235 240
 Ile Glu Arg

<210> 17
 <211> 503
 <212> PRT
 <213> chicken alpha (IX) chain precursor

<400> 17

Met Lys Ser Asn Trp Lys Ile Thr Ala Phe Leu Tyr Met Cys Ser Phe

275 280 285
 Ile Asp Gly Glu Arg Gly Pro Asn Gly Pro Pro Gly Pro Pro Gly Pro
 290 295 300
 Asp Gly Asp Ala Gly Lys Ala Gly Ser Pro Gly Leu Pro Gly Glu Pro
 305 310 315 320
 Gly Ala Asp Gly Leu Thr Gly Pro Asp Gly Ser Pro Gly Ala Thr Gly
 325 330 335
 Pro Lys Gly Gln Lys Gly Glu Pro Gly Pro Pro Gly Ala Arg Gly Leu
 340 345 350
 Pro Gly Lys Gly Leu Leu Gly Pro Pro Gly Pro Ala Gly Ala Ala Gly
 355 360 365
 Leu Pro Gly Glu Val Gly Arg Ala Gly Pro Pro Gly Asp Pro Gly Lys
 370 375 380
 Arg Gly Pro Pro Gly Pro Pro Gly Pro Pro Gly Pro Arg Gly Thr Ile
 385 390 395 400
 Gly Leu Gln Asp Gly Asp Pro Leu Cys Pro Asn Ala Cys Pro Pro Gly
 405 410 415
 Glu Ala Gly Glu Arg Gly Glu Arg Gly Phe Pro Gly Arg Gly Val Lys
 420 425 430
 Gly Leu Pro Gly Pro Arg Gly Leu Pro Gly Glu Pro Gly Lys Pro Ser
 435 440 445
 Tyr Gly Arg Glu Gly Arg Asp Gly Val Arg Gly Pro Pro Gly Val Ala
 450 455 460
 Gly Gln Pro Gly Ile Pro Gly Pro Pro Gly Pro Pro Gly Pro Pro Gly
 465 470 475 480
 Tyr Cys Glu Pro Ser Ser Cys Arg Met Gln Ala Gly Gln Arg Ala Ala
 485 490 495
 Gly Lys Asn Met Lys Gly Pro
 500

<210> 18
 <211> 245
 <212> PRT
 <213> mouse collagen type IX NC4 domain

<400> 18

Thr Leu Lys Arg Arg Ala Arg Phe Pro Ala Asn Ser Ile Ser Asn Gly
 1 5 10 15

Gly Ser Glu Leu Cys Pro Lys Ile Arg Ile Gly Gln Asp Asp Leu Pro
 20 25 30
 Gly Phe Asp Leu Ile Ser Gln Phe Gln Ile Glu Lys Ala Ala Ser Arg
 35 40 45
 Arg Thr Ile Gln Arg Val Val Gly Ser Thr Ala Leu Gln Val Ala Tyr
 50 55 60
 Lys Leu Gly Ser Asn Val Asp Phe Arg Ile Pro Thr Arg His Leu Tyr
 65 70 75 80
 Pro Ser Gly Leu Pro Glu Glu Tyr Ser Phe Leu Thr Thr Phe Arg Met
 85 90 95
 Thr Gly Ser Thr Leu Glu Lys His Trp Asn Ile Trp Gln Ile Gln Asp
 100 105 110
 Ser Ala Gly Arg Glu Gln Val Gly Val Lys Ile Asn Gly Gln Thr Lys
 115 120 125
 Ser Val Ala Phe Ser Tyr Lys Gly Leu Asp Gly Ser Leu Gln Thr Ala
 130 135 140
 Ala Phe Leu Asn Leu Pro Ser Leu Phe Asp Ser Arg Trp His Lys Leu
 145 150 155 160
 Met Ile Gly Val Glu Arg Thr Ser Ala Thr Leu Phe Ile Asp Cys Ile
 165 170 175
 Arg Ile Glu Ser Leu Pro Ile Lys Pro Arg Gly Gln Ile Asp Ala Asp
 180 185 190
 Gly Phe Ala Val Leu Gly Lys Leu Val Asp Asn Pro Gln Val Ser Val
 195 200 205
 Pro Phe Glu Leu Gln Trp Met Leu Ile His Cys Asp Pro Leu Arg Pro
 210 215 220
 Arg Arg Glu Thr Cys His Glu Leu Pro Ile Arg Ile Thr Thr Ser Gln
 225 230 235 240
 Thr Thr Asp Glu Arg
 245

<210> 19
 <211> 921
 <212> PRT
 <213> mouse alpha (IX) chain precursor
 <400> 19

Met Lys Asn Phe Trp Lys Ile Ser Val Phe Phe Cys Val Cys Ser Cys
 1 5 10 15
 Leu Gly Pro Trp Val Ser Ala Thr Leu Lys Arg Arg Ala Arg Phe Pro
 20 25 30
 Ala Asn Ser Ile Ser Asn Gly Gly Ser Glu Leu Cys Pro Lys Ile Arg
 35 40 45
 Ile Gly Gln Asp Asp Leu Pro Gly Phe Asp Leu Ile Ser Gln Phe Gln
 50 55 60
 Ile Glu Lys Ala Ala Ser Arg Arg Thr Ile Gln Arg Val Val Gly Ser
 65 70 75 80
 Thr Ala Leu Gln Val Ala Tyr Lys Leu Gly Ser Asn Val Asp Phe Arg
 85 90 95
 Ile Pro Thr Arg His Leu Tyr Pro Ser Gly Leu Pro Glu Glu Tyr Ser
 100 105 110
 Phe Leu Thr Thr Phe Arg Met Thr Gly Ser Thr Leu Glu Lys His Trp
 115 120 125
 Asn Ile Trp Gln Ile Gln Asp Ser Ala Gly Arg Glu Gln Val Gly Val
 130 135 140
 Lys Ile Asn Gly Gln Thr Lys Ser Val Ala Phe Ser Tyr Lys Gly Leu
 145 150 155 160
 Asp Gly Ser Leu Gln Thr Ala Ala Phe Leu Asn Leu Pro Ser Leu Phe
 165 170 175
 Asp Ser Arg Trp His Lys Leu Met Ile Gly Val Glu Arg Thr Ser Ala
 180 185 190
 Thr Leu Phe Ile Asp Cys Ile Arg Ile Glu Ser Leu Pro Ile Lys Pro
 195 200 205
 Arg Gly Gln Ile Asp Ala Asp Gly Phe Ala Val Leu Gly Lys Leu Val
 210 215 220
 Asp Asn Pro Gln Val Ser Val Pro Phe Glu Leu Gln Trp Met Leu Ile
 225 230 235 240
 His Cys Asp Pro Leu Arg Pro Arg Arg Glu Thr Cys His Glu Leu Pro
 245 250 255
 Ile Arg Ile Thr Thr Ser Gln Thr Thr Asp Glu Arg Gly Pro Pro Gly
 260 265 270

Glu Gln Gly Pro Pro Gly Pro Pro Gly Pro Pro Gly Val Pro Gly Ile
 275 280 285

Asp Gly Ile Asp Gly Asp Arg Gly Pro Lys Gly Pro Pro Gly Pro Pro
 290 295 300

Gly Pro Pro Gly Asp Pro Gly Lys Pro Gly Ala Pro Gly Lys Pro Gly
 305 310 315 320

Thr Pro Gly Ala Asp Gly Leu Thr Gly Pro Asp Gly Ser Pro Gly Ser
 325 330 335

Val Gly Pro Arg Gly Gln Lys Gly Glu Pro Gly Val Pro Gly Ser Arg
 340 345 350

Gly Phe Pro Gly Arg Gly Ile Pro Gly Pro Pro Gly Pro Pro Gly Thr
 355 360 365

Thr Gly Leu Pro Gly Glu Leu Gly Arg Val Gly Pro Ile Gly Asp Pro
 370 375 380

Gly Lys Arg Gly Pro Pro Gly Pro Pro Gly Pro Pro Gly Pro Ser Gly
 385 390 395 400

Thr Ile Gly Phe His Asp Gly Asp Pro Leu Cys Pro Asn Ser Cys Pro
 405 410 415

Pro Gly Arg Ser Gly Tyr Pro Gly Leu Pro Gly Met Arg Gly His Lys
 420 425 430

Gly Ala Lys Gly Glu Ile Gly Glu Pro Gly Arg Gln Gly His Lys Gly
 435 440 445

Glu Glu Gly Asp Gln Gly Glu Leu Gly Glu Val Gly Ala Gln Gly Pro
 450 455 460

Pro Gly Pro Gln Gly Leu Arg Gly Ile Thr Gly Ile Val Gly Asp Lys
 465 470 475 480

Gly Glu Lys Gly Ala Arg Gly Phe Asp Gly Glu Pro Gly Pro Gln Gly
 485 490 495

Ile Pro Gly Ala Ala Gly Asp Gln Gly Gln Arg Gly Pro Pro Gly Glu
 500 505 510

Thr Gly Pro Lys Gly Asp Arg Gly Ile Gln Gly Ser Arg Gly Ile Pro
 515 520 525

Gly Ser Pro Gly Pro Lys Gly Asp Thr Gly Leu Pro Gly Val Asp Gly
 530 535 540

Arg Asp Gly Ile Pro Gly Met Pro Gly Thr Lys Gly Glu Ala Gly Lys
 545 550 555 560

Pro Gly Pro Pro Gly Asp Val Gly Leu Gln Gly Leu Pro Gly Val Pro
 565 570 575

Gly Ile Pro Gly Ala Lys Gly Val Ala Gly Glu Lys Gly Asn Thr Gly
 580 585 590

Ala Pro Gly Lys Pro Gly Gln Leu Gly Ser Ser Gly Lys Pro Gly Gln
 595 600 605

Gln Gly Pro Pro Gly Glu Val Gly Pro Arg Gly Pro Arg Gly Leu Pro
 610 615 620

Gly Ser Arg Gly Pro Val Gly Pro Glu Gly Ser Pro Gly Ile Pro Gly
 625 630 635 640

Lys Leu Gly Ser Val Gly Ser Pro Gly Leu Pro Gly Leu Pro Gly Pro
 645 650 655

Pro Gly Leu Pro Gly Met Lys Gly Asp Arg Gly Val Phe Gly Glu Pro
 660 665 670

Gly Pro Lys Gly Glu Gln Gly Ala Ser Gly Glu Glu Gly Glu Ala Gly
 675 680 685

Ala Arg Gly Asp Leu Gly Asp Met Gly Gln Pro Gly Pro Lys Gly Ser
 690 695 700

Val Gly Asn Pro Gly Glu Pro Gly Leu Arg Gly Pro Glu Gly Ile Arg
 705 710 715 720

Gly Leu Pro Gly Val Glu Gly Pro Arg Gly Pro Pro Gly Pro Arg Gly
 725 730 735

Met Gln Gly Glu Gln Gly Ala Thr Gly Leu Pro Gly Ile Gln Gly Pro
 740 745 750

Pro Gly Arg Ala Pro Thr Asp Gln His Ile Lys Gln Val Cys Met Arg
 755 760 765

Val Val Gln Glu His Phe Val Glu Met Ala Ala Ser Leu Lys Arg Pro
 770 775 780

Asp Thr Gly Ala Ser Gly Leu Pro Gly Arg Pro Gly Pro Pro Gly Pro
 785 790 795 800

Pro Gly Pro Pro Gly Glu Asn Gly Phe Pro Gly Gln Met Gly Ile Arg
 805 810 815

Gly Leu Pro Gly Ile Lys Gly Pro Pro Gly Ala Leu Gly Leu Arg Gly
820 825 830

Pro Lys Gly Asp Leu Gly Glu Lys Gly Glu Arg Gly Pro Pro Gly Arg
835 840 845

Gly Pro Lys Gly Leu Pro Gly Ala Ile Gly Leu Pro Gly Asp Pro Gly
850 855 860

Pro Ala Ser Tyr Gly Lys Asn Gly Arg Asp Gly Glu Gln Gly Pro Pro
865 870 875 880

Gly Val Ala Gly Ile Pro Gly Val Pro Gly Pro Pro Gly Pro Pro Gly
885 890 895

Pro Pro Gly Phe Cys Glu Pro Ala Ser Cys Thr Leu Gln Ser Gly Gln
900 905 910

Arg Ala Phe Ser Lys Gly Pro Asp Lys
915 920